



# ATM Policing by Service Category for SVC/SoftPVC

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## Feature History

Release	Modification
12.2(4)B	This feature was introduced on the Cisco 6400 NSP.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.

This document describes the ATM Policing by Service Category for SVC/SoftPVC feature in Cisco IOS Release 12.2(13)T and includes the following sections:

- [Feature Overview, page 1](#)
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## Feature Overview

When configured, an ATM switch at the network side of a user-to-network (UNI) interface polices the flow of cells in the forward (into the network) direction of a virtual connection. These traffic policing mechanisms are known as usage parameter control (UPC). With UPC, the switch determines whether received cells comply with the negotiated traffic management values and takes one of the following actions on violating cells:

- Pass the cell without changing the cell loss priority (CLP) bit in the cell header.
- Tag the cell with a CLP bit value of 1.
- Drop (discard) the cell.



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The ATM Policing by Service Category for SVC/SoftPVC feature enables you to specify which traffic to police, based on service category, on switched virtual circuits (SVCs) or terminating VCs on the destination end of a soft VC.

For more information on UPC, see the “Traffic and Resource Management” chapter in the *Guide to ATM Technology*.

## Benefits

This feature enables you to select which and how traffic is affected by UPC. For example, you can configure your switch to pass all UBR traffic, but tag all other traffic types.

## Related Features and Technologies

- Intelligent early packet discard (EPD)
- Intelligent partial (tail) packet discard

## Related Documents

- *ATM Switch Router Software Configuration Guide*
- *ATM and Layer 3 Switch Router Command Reference*
- *Guide to ATM Technology*
- *ATM Forum UNI 3.1 Specification*

## Supported Platforms

This feature is supported on the node switch processor (NSP) of the Cisco 6400 carrier-class broadband aggregator.

## Supported Standards, MIBs, and RFCs

### Standards

None

### MIBs

CISCO-ATM-IF-MIB.my—New objects were created for per-service category SVC UPC intent.

To obtain lists of supported MIBs by platform and Cisco IOS release, and to download MIB modules, go to the Cisco MIB website on Cisco.com at the following URL:

<http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>

### RFCs

None

## Configuration Tasks

See the following sections for configuration tasks for the ATM Policing by Service Category for SVC/SoftPVC feature. Each task in the list is identified as either required or optional:

- [Configuring ATM Policing by Service Category for SVC/SoftPVC, page 3](#) (Required)
- [Verifying ATM Policing by Service Category for SVC/SoftPVC, page 3](#) (Optional)

## Configuring ATM Policing by Service Category for SVC/SoftPVC

To configure the ATM Policing by Service Category for SVC/SoftPVC feature, use the following commands beginning in global configuration mode:

	Command	Purpose
<b>Step 1</b>	Switch(config)# <b>interface atm slot/subslot/port</b>	Selects the ATM interface.
<b>Step 2</b>	Switch(config-if)# <b>atm svc-upc-intent</b> [{ <b>abr</b>   <b>cbr</b>   <b>vbr-rt</b>   <b>vbr-nrt</b>   <b>ubr</b> }] { <b>tag</b>   <b>pass</b>   <b>drop</b> }  (Repeat this step for each service category and UPC mode combination.)	Specifies the UPC mode. If no service category is specified, then the UPC mode configuration is applied to all traffic types.

## Verifying ATM Policing by Service Category for SVC/SoftPVC

- Step 1** Enter the **show atm vc** or **show atm vp EXEC** command to display the UPC mode for a particular VC or VP.

```
Switch# show atm vc int atm 0/0/1 2 120

Interface:ATM0/0/1, Type:oc3suni
VPI = 2 VCI = 120
Status:DOWN
Time-since-last-status-change:1w1d
Connection-type:PVC
Cast-type:point-to-multipoint-leaf
Packet-discard-option:disabled
Usage-Parameter-Control (UPC):pass
Wrr weight:2
Number of OAM-configured connections:0
OAM-configuration:disabled
OAM-states: Not-applicable
Cross-connect-interface:ATM0/0/1, Type:oc3suni
...
```

- Step 2** Enter the **show atm interface EXEC** command. If the UPC mode is not the same for all service categories, the “Svc Upc Intent” field displays “by sc.”

```
Switch# show atm interface atm 8/0/1

Interface:      ATM8/0/1          Port-type:      oc3suni
IF Status:     UP                Admin Status:   up
Auto-config:   enabled           AutoCfgState:  completed
IF-Side:       Network          IF-type:        NNI
Uni-type:      not applicable   Uni-version:    not applicable
Max-VPI-bits:  8                Max-VCI-bits:  14
Max-VP:        255            Max-VC:         16383
ConfMaxSvpcVpi:255          CurrMaxSvpcVpi:255
ConfMaxSvccVpi:255          CurrMaxSvccVpi:255
ConfMinSvccVci:35          CurrMinSvccVci:35
Svc Upc Intent:by sc      Signalling:     Enabled
ATM Address for Soft VC:47.0091.8100.0000.0002.b9ae.9301.4000.0c84.0010.00
Configured virtual links:
  PVCLs  SoftVCLs  SVCLs  TVCLs  PVPLs  SoftVPLs  SVPLs  Total-Cfgd  Inst-Conns
    3      4        0      0      1      0          0        8          7
Logical ports(VP-tunnels):  0
Input cells:  3036674          Output cells:  3036816
5 minute input rate:          0 bits/sec,      0 cells/sec
5 minute output rate:         0 bits/sec,      0 cells/sec
Input AAL5 pkts:1982638, Output AAL5 pkts:1982687, AAL5 crc errors:0
```

## Troubleshooting Tips

If a VC is not configured with the appropriate UPC mode, make sure that the VC was set up after the **atm svc-upc-intent** command was configured. Changes to the UPC mode take affect after the VC is torn down and set up again.

# Monitoring and Maintaining ATM Policing by Service Category for SVC/SoftPVC

Use the commands listed below to monitor and maintain ATM Policing by Service Category for SVC/SoftPVC:

Command	Purpose
Switch# <b>show atm interface</b>	Displays ATM-specific information about an ATM interface.
Switch# <b>show controllers atm slot/subslot/port</b>	Displays information about a physical port device. Includes dropped (or discarded) cells.
Switch# <b>show atm vc [interface atm slot/subslot/port]</b>	Displays the configured UPC action and intelligent packet discard mechanisms, as well as the number of cells discarded due to UPC violations.

## Example: Monitoring and Maintaining ATM Policing by Service Category for SVC/SoftPVC

```
Switch# show atm vc interface atm 3/0/1.51 51 16

Interface: ATM3/0/1.51, Type: oc3suni
VPI = 51 VCI = 16
Status: DOWN
Time-since-last-status-change: 2w0d
Connection-type: PVC
Cast-type: point-to-point
Packet-discard-option: enabled
Usage-Parameter-Control (UPC): pass
Wrr weight: 32
Number of OAM-configured connections: 0
OAM-configuration: disabled
OAM-states: Not-applicable
Cross-connect-interface: ATM2/0/0, Type: ATM Swi/Proc
Cross-connect-VPI = 0
Cross-connect-VCI = 73
Cross-connect-UPC: pass
Cross-connect OAM-configuration: disabled
Cross-connect OAM-state: Not-applicable
Encapsulation: AAL5ILMI
Threshold Group: 6, Cells queued: 0
Rx cells: 0, Tx cells: 0
Tx Clp0:0, Tx Clp1: 0
Rx Clp0:0, Rx Clp1: 0
Rx Upc Violations:0, Rx cell drops:0
Rx pkts:0, Rx pkt drops:0
Rx connection-traffic-table-index: 6
Rx service-category: UBR (Unspecified Bit Rate)
Rx pcr-clp01: 424
Rx scr-clp01: none
Rx mcr-clp01: none
Rx cdvt: 1024 (from default for interface)
Rx mbs: none
Tx connection-traffic-table-index: 6
Tx service-category: UBR (Unspecified Bit Rate)
Tx pcr-clp01: 424
Tx scr-clp01: none
Tx mcr-clp01: none
Tx cdvt: none
Tx mbs: none
No AAL5 connection registered
```

## Configuration Examples

This section provides the following configuration example:

- [Non-UBR Traffic Policing: Example, page 6](#)

## Non-UBR Traffic Policing: Example

In the following example, the UBR traffic on ATM 3/0/0 is passed while all other traffic is policed:

```
Switch(config)# interface atm 3/0/0
Switch(config-if)# atm svc-upc-intent ubr pass
Switch(config-if)# atm svc-upc-intent cbr tag
Switch(config-if)# atm svc-upc-intent vbr-rt tag
Switch(config-if)# atm svc-upc-intent vbr-nrt tag
Switch(config-if)# atm svc-upc-intent abr drop
```

## Command Reference

The following commands are introduced or modified in the feature or features documented in this module. For information about these commands, see the *Cisco IOS Quality of Service Solutions Command Reference* at [http://www.cisco.com/en/US/docs/ios/qos/command/reference/qos\\_book.html](http://www.cisco.com/en/US/docs/ios/qos/command/reference/qos_book.html). For information about all Cisco IOS commands, use the Command Lookup Tool at <http://tools.cisco.com/Support/CLILookup> or a Cisco IOS master commands list.

- **atm svc-upc-intent**

# Glossary

**ABR**—available bit rate. QoS class defined by the ATM Forum for ATM networks. ABR is used for connections that do not require timing relationships between source and destination. ABR provides no guarantees in terms of cell loss or delay, providing only best-effort service. Traffic sources adjust their transmission rate in response to information they receive describing the status of the network and its capability to successfully deliver data. Compare with CBR, UBR, and VBR.

**CBR**—constant bit rate. QoS class defined by the ATM Forum for ATM networks. CBR is used for connections that depend on precise clocking to ensure undistorted delivery. Compare with ABR, UBR, and VBR.

**CLP**—cell loss priority. Field in the ATM cell header that determines the probability of a cell being dropped if the network becomes congested. Cells with CLP = 0 are insured traffic, which is unlikely to be dropped. Cells with CLP = 1 are best-effort traffic, which might be dropped in congested conditions to free up resources to handle insured traffic.

**PVC**—permanent virtual circuit (or connection). Virtual circuit that is permanently established. PVCs save bandwidth associated with circuit establishment and tear down in situations where certain virtual circuits must exist all the time. In ATM terminology, called a permanent virtual connection. Compare with SVC. See also virtual circuit.

**soft PVC**—A PVC-SVC hybrid in which only the two terminating virtual connection links (VCLs) at either end are permanent and the rest of the VCLs are switched (SVC). Like the PVC, a soft PVC is permanent and the called party cannot drop the connection. Like the SVC, a soft PVC is automatically rerouted if a switch or link in the path fails.

**SVC**—switched virtual circuit. Virtual circuit that is dynamically established on demand and is torn down when transmission is complete. SVCs are used in situations where data transmission is sporadic. See also virtual circuit. Called a switched virtual connection in ATM terminology. Compare with PVC.

**tagged traffic**—ATM cells that have their CLP bit set to 1. If the network is congested, tagged traffic can be dropped to ensure the delivery of higher-priority traffic. Sometimes called DE traffic. See also CLP.

**traffic policing**—Process used to measure the actual traffic flow across a given connection and compare it to the total admissible traffic flow for that connection. Traffic outside of the agreed upon flow can be tagged (where the CLP bit is set to 1) and can be discarded en route if congestion develops. Traffic policing is used in ATM, Frame Relay, and other types of networks. Also known as admission control, permit processing, rate enforcement, and UPC. See also tagged traffic.

**UBR**—unspecified bit rate. QoS class defined by the ATM Forum for ATM networks. UBR allows any amount of data up to a specified maximum to be sent across the network but there are no guarantees in terms of cell loss rate and delay. Compare with ABR, CBR, and VBR.

**UPC**—usage parameter control. See traffic policing.

**VBR**—variable bit rate. QoS class defined by the ATM Forum for ATM networks. VBR is subdivided into a real time (RT) class and non-real time (NRT) class. VBR (RT) is used for connections in which there is a fixed timing relationship between samples. VBR (NRT) is used for connections in which there is no fixed timing relationship between samples but that still need a guaranteed QoS. Compare with ABR, CBR, and UBR.

**virtual circuit**—Logical circuit created to ensure reliable communication between two network devices. A virtual circuit is defined by a VPI/VCI pair, and can be either permanent (PVC) or switched (SVC). Virtual circuits are used in Frame Relay and X.25. In ATM, a virtual circuit is called a virtual channel. Sometimes abbreviated VC.

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